

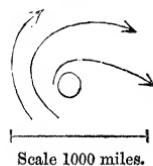
IV. "A Development of the Theory of Cyclones." By FRANCIS GALTON, F.R.S. Received December 25, 1862.

Most meteorologists are agreed that a circumscribed area of barometric depression is usually a locus of light ascending currents, and therefore of an indraught of surface winds which create a retrograde whirl (in our hemisphere), because they bring to their destination a lateral impulse, partly due to the greater easterly speed of the earth's surface whence the southern portion of the indraught took its departure, and partly due to the less easterly, or we may say greater westerly, speed of its northern portion.

Conversely, we ought to admit that a similar area of barometric elevation is usually a locus of dense descending currents, and therefore of a dispersion of a cold dry atmosphere, plunging from the higher regions upon the surface of the earth, which, flowing away radially on all sides, becomes at length imbued with a lateral motion due to the above-mentioned cause, though acting in a different manner and in opposite directions. The currents necessarily travel with diminished radial speed as they widen out from their central area of dispersion, and the eastward tendency of the northern portion of the system and the westward tendency of the southern become more overpowering. It may be presumed, on consideration of the extreme mobility of the air, that a continuous dispersion of currents would result in the yielding of the east and west winds, which had no tangential movement of their own, to the curvature of the others, and that we should witness a disposition of currents like those in the annexed diagram, which is copied from an actual occurrence on December 2, 1861. The appearance is that of a centre of calms whence currents flow in radial lines, rapidly curving to the right and forming a sort of "anticyclone."

Dove's law of gyration is so fertile in result, that it accounts for the same direct rotation of a cold wind by a wholly different process. As an antithesis to his theory of cyclones being due to an equatorial current pressing against quiescent air, he adds (Law of Storms), with a view of illustrating his position, and not of meeting cases that practically occur, polar cyclones, "if they exist," would have a direct rotation,

Fig. 1.



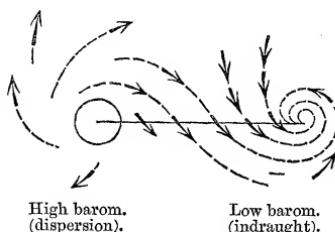
Scale 1000 miles.

It is not necessary to allude further to his well-known theory—it is sufficient to show that two separate causes cooperate in producing a rotation or curvature of currents such as I have described. I have not the slightest doubt that a strong curvature of atmospheric currents to the right does frequently exist, owing to the descent of cold air from above; for in lately charting the weather of Europe thrice daily during a month, I found it more or less present on from fifty to sixty occasions. Its existence is consonant to what we should expect. It is hardly possible to conceive masses of air rotating in a retrograde sense in close proximity, as cyclonists suppose, without an intermediate area of direct rotation, which would, to use a mechanical simile, be in gear with both of them, and make the movements of the entire system correlative and harmonious.

The result I have thus far arrived at, and which I should look for hereafter, is that whenever the barometer shows circumscribed areas of marked elevation and depression at distances not exceeding 1500 miles apart, a line drawn from the locus of highest to that of lowest barometer would be cut by parallel wind-currents at an angle of about  $45^{\circ}$ , in the way shown in the diagram.

I doubt if it be of advantage to investigate the changes of wind produced by a system of indraught and dispersion passing over any locality, because the barometrical sections vary so rapidly as to make the incoming portion unsymmetrical with that which has already passed over.

Fig. 2.



V. "On the Immunity enjoyed by the Stomach from being digested by its own Secretion during Life." By FREDERICK W. PAVY, M.D. Communicated by Dr. SHARPEY, Sec. R.S. Received December 11, 1862.

(Abstract.)

The author referred to the communication by John Hunter "On the Digestion of the Stomach after Death," published in the 'Phil-